Transportation

Highways

Affected environment

Highways typically follow natural features like lakes, rivers and valleys. They can directly affect the amount of winter snowshoe hare and denning habitat available by converting forests into road surfaces, rights-of-way, and the associated maintenance facilities and gravel pits (Ruediger et al. 2000, p. 2-17).

Highways can alter landscapes by fragmenting large tracts of land. As the standard of road increases from gravel to two-lane highway, traffic volume increases. According to the LCAS, lynx may become intimidated by traffic and may not cross highways when the volume reaches from 2,000 to 4,000 vehicles per day, particularly if traffic continues during the night. Parts of the following highways traverse lynx linkage areas – see Table 3-48. All the highways in the linkage areas, including most major highways in Idaho, western Montana, western Wyoming and northern Utah, were considered. Linkage areas were identified at interagency meetings held in amendment area states in 2001 and 2002. See Appendix B.

The degree of impact increases as highways are upgraded from two lanes to four. Four-lane highways commonly have fences on each side, service roads, paralleling railroads and other impediments like 'Jersey barriers' that make crossing even more difficult. While the FS and BLM don't have authority over these highways, if right-of-way is involved, they can influence the consideration of wildlife crossings. Table 3-49 on the next page shows highways that have been upgraded from two lanes to four during the last decade and those planned during the next decade.

Beginning in 2004, a major improvement is planned on a 56-mile stretch of US Highway 93 in Montana from Evaro to Polson. Thirteen miles from Ronan to Polson will be widened to four lanes. A third lane will be added to parts of the remaining 43 miles – the Evaro portion is part of a lynx linkage area.

The reconstruction includes wildlife crossings and fencing to help wildlife

Table 3-48. Highways in lynx linkage areas

	Interstate highways	US highways	State highways
Idaho	I-15 & I-90	US 2, 12, 26, 30, 93 & 95	ID 75
Montana	I-15 & I-90	US 2, 12, 89, 93, 187, 191,212, 287 & 310	MT 37, 43, 56, 72, 83 & 200
Utah	I-80	US 40	n/a
Wyoming	n/a	US 14, 16, 20, 26, 28, 30, 189, 191 & 212	WY 28

move across the highway. The wildlife measures will increase the cost of the project five to eight percent.

Idaho, Montana, Utah and Wyoming all are evaluating ways to provide wildlife crossings and implementing their findings in their highway reconstruction plans (Stockstead, Soper, Stark & Just, pers. com.).

Effects

Table 3-49 shows the highways planned to be widened in lynx linkage areas over the next ten years.

Alternative A, no action

Under the no-action alternative, no changes would be made to plans that would require agencies to consider lynx habitat connectivity. Methods to provide safe wildlife crossings are being researched by all the state highway organizations in the amendment area, and are being incorporated into highway improvements.

Alternatives B, C, D and E

The management direction applying to highways deals with linkage areas and wildlife crossings, and includes Objectives ALL O1 and HU O6, Standard LINK S1 and Guideline ALL G1 – see Table 2-1 in Chapter 2.

Linkage areas for lynx already have been identified – see Figure 1-1. State and federal highway officials are using this data to identify potential wildlife crossings.

Other management direction would place more emphasis on wildlife crossings and may result in higher construction costs, but should facilitate wildlife movement and reduce accidents, injury and wildlife mortality.

Highway programs in the amendment area already have incorporated some wildlife crossings into their designs, so this standard may not cause any change beyond what's already being done.

Table 3-49. Highways upgrading from two to four lanes

Highway #	Reconstructed during last 10 years	To be reconstructed in next 10 years	In lynx linkage area?
Idaho			
US 95	MP* 508.1 to MP 510.6, near Bonners Ferry	n/a	no
US 95	n/a	MP* 522.2 to MP 527.25	no
US 95	n/a	MP 537.85 to MP 538.6, the Canadian border	yes
Montana			
US 2	Kalispell, 4.73 miles	n/a	no
US 93	Florence to Lolo, 23.4 miles	n/a	no
US 93	Somers intersection of Hiway 82 N, 4 miles	n/a	no
US 93	n/a	Ronan to Polson, 13 miles	yes
US 93	n/a	Hamilton to Florence, 11.6 miles	no
Wyoming			
US 30	n/a	Junction I-80 to Idaho state line, 100+ miles	yes

MP = mile point
(Ebret, Smith, Rains, Watson & Milburn, pers. com.)

Forest roads

Besides the legal direction described in Chapter 1, the following direction applies to forest roads.

36 CFR 212 – Administration of the forest transportation system
Adopted in January 2001 after the LCAS was finalized, this new policy directs the agency to maintain a safe, environmentally sound road network that responds to public needs and is affordable to manage. The policy includes a science-based process called *Roads Analysis*, designed to help managers make better decisions about roads.

Public Forest Service Roads
In December 2000, the FS proposed designating most of its arterial and collector roads as *public roads*, which would be open and available to the public on a regular and consistent basis, as defined in 23 U.S.C. 101 (USDA FS 2000b).

Affected environment

The amendment area contains more than 15,000 miles of open roads in lynx habitat. Roads can directly affect the amount of denning and foraging habitat available by removing forest cover.

According to the LCAS, lynx may use little-traveled roadways for travel and foraging in good snowshoe hare habitat. However, they seem to prefer to move through continuous forests, and frequently use ridges, saddles, and riparian areas.

Lynx may tolerate some level of human disturbance. Road density doesn't appear to affect lynx habitat selection (Ruediger et al. 2000, p. 12).

While displacement by humans does not appear to be a major factor, access via roads may increase the mortality risk to lynx from incidental trapping or illegal shooting, and by allowing competing carnivores, such as coyotes and mountain lions, access into lynx habitat in winter on compacted roads or trails.

In the amendment area, 8,690 miles of open forest road in lynx habitat are maintained for high-clearance vehicles (Maintenance level 2) and another 7,000 miles of open road are maintained for low-clearance vehicles (Maintenance levels 3 to 5) – see Table 3-50. The majority is on NF lands.

Table 3-50. Miles of forest road in lynx habitat in the amendment area

Maintenance level 2 (suitable only for high-clearance vehicles)	8,690 miles
Maintenance levels 3-5 (suitable for low-clearance vehicles)	7,000 miles
Paved to two or more lanes, last *decade*	15 miles
New & open, last *five years*	15 miles
‡Paved for resource reasons, last *five years*	2 miles

‡One-lane roads with low traffic

Present FS policy is to reduce the amount of open roads in maintenance levels 2 through 5, and to improve roads left open to reduce effects. The BLM has not developed road systems like the FS has, they are not actively reducing their road network.

New forest road construction has been drastically reduced during the last decade (USDA FS 2000b). Most road building is for timber harvest – very little is left open after logging is done. Some new road has been built to access campgrounds. Only 15 miles of road built in lynx habitat during the past five years are open to public use.

Many FS roads have heavy public use, and meet the use-and-needs criteria for county or state jurisdictions. In lynx habitat, about 15 miles of heavily used roads have been paved to two lanes during the last decade – see Table 3-50 on the previous page. The jurisdiction of these roads is usually turned over to state or county public road agencies to maintain after they are built.

Some low-traffic, one-lane roads are paved to reduced the sediment delivered to streams. In these cases, the traffic level is not considered to justify paving, and the roads are not considered public roads. See Tables K-12 and K-13 in Appendix K for a breakdown by unit.

Effects

Alternative A, no action

The theme for the FS is *fewer and better roads*. The trend is to continue to minimize development, to classify existing roads as either needed or unneeded, and to decommission unneeded roads. Many remaining roads remain targeted for improvement to make them comply with standards for safety and environmental protection.

For the BLM, the trend for forest roads is to continue to minimize development. The BLM does not have plans to decommission roads, because it has far fewer roads than the FS. Roads found to be surplus to their needs are decommissioned.

A Roads Analysis would be done before any work was done on FS roads. The analysis would identify resource concerns so projects would address them.

Table 3-51 shows the actions planned for FS and BLM forest roads in lynx habitat if budgets permit.

Table 3-51. Future forest roads in lynx habitat in the amendment area

Planned to be paved to two or more lanes, next *decade*	45 miles
Planned on ridge-top & open, next *decade*	5 miles
Planned new & open, next *five years*	10 miles
Planned to be upgraded, next *five years*	235 miles
‡Planned to be paved for resource reasons, next *five years*	2 miles

‡One-lane roads with low traffic
Future activities are estimates rounded to the nearest five miles & are subject to change.

During the next *decade*,

- About 45 miles may be widened to two lanes and paved to improve safety, air quality and to result the sediment delivered to streams.
- Five miles may be built on ridge-tops and left open. Ridge-tops are a much-preferred road location. Roads built on ridge-tops generally have less drainage problems with fewer culverts and ditches to maintain. The area exposed by cut and fill slopes is minimized, leaving less area open to slides.

During the next *five* years,

- About ten miles may be built and left open, mostly to serve recreational needs.
- About 235 miles may be improved, to reduce dust and stream siltation, straighten curves, widen roadways, add turnouts, improve drainage facilities and eliminate safety hazards. This work would improve traffic flow, increase design speed, increase safety and accommodate expected traffic increases.
- Two miles may be paved to reduce the sediment delivered to streams.

Alternative B, the Proposed Action

Alternative B proposes only guidelines for forest roads – see Table 2-1 in Chapter 2. Guidelines are preferred or advisable courses of action. Guidelines may be deviated from if reasons can be documented. See Tables K-12 and K-13 in Appendix K for a breakdown by unit.

Guideline ALL G1 would apply to the forest highways planned for paving during the next decade. Most of these miles would not have enough traffic to make this a concern. But where traffic is heavy, Guideline ALL G1 would heighten awareness about wildlife crossings and lead to investigating fencing and underpasses or overpasses to reduce the risk of mortality. This would add to the cost of construction.

Guideline HU G6 would discourage upgrades to unpaved roads. Disallowing upgrades may compromise safety, reduce air quality and increase the sediment delivered to streams. As the population grows and more people look to the outdoors for recreation, traffic may well increase even if roads aren't improved, which could increase the potential for accidents.

Two miles of paving for resource reasons are planned during the next five years. One mile may be paved to reduce the sediment delivered by a road located beside a stream in bull trout habitat – bull trout is a threatened species.

Guideline HU G6 also may affect the 235 miles of upgrades planned during the next five years. Changes are planned in road alignment and surfacing that would decrease the sediment delivered to streams, dust and traffic flow, increase design speed and safety, and accommodate more traffic. These improvements would have to be justified for the work to go forward. Most, if not all, of these roads lack the traffic volume

that would make them a concern or threat to lynx as described in the LCAS.

Guideline HU G7 could affect the ten miles of new permanent road construction planned for the next five years. If these roads were located near forested stringers – which may be important for lynx habitat connectivity – leaving them open in such locations would have to be justified.

Guideline HU G7 also discourages building new roads on ridge-tops and leaving them open. In the next decade, five such miles of road are planned. The alternate location for these roads is on side-slopes averaging 40 percent. Roads built on ridge-tops generally have less drainage problems with fewer culverts and ditches to maintain. The area exposed by cut and fill slopes is minimized, leaving less area open to slides.

Guideline HU G8 would minimize roadside brush cutting, which could increase accidents and animal mortality by reducing the sight distance and the time animals are visible to motorists. However, brush cutting can also result in more big game browsing on the brush next to roads.

Guideline HU G9 would restrict public use on new roads. Only ten miles of new road construction is planned to be left open during the next five years. Leaving these miles open would have to be justified.

Alternatives C, D & E

For forest roads and highways, Alternatives C, D and E would have similar effects to Alternative B, except that *Guideline HU G6* has been modified to encourage mitigation measures when the roads are upgraded. Guideline HU G6 would encourage the use of wildlife crossings and fencing to reduce or avoid the mortality caused by collisions.

Cumulative effects

Highways

Alternative A

The past, present and reasonably foreseeable actions listed in Appendix L have had a limited effect on highways except to incorporate management direction related to stream and river crossings.

Alternatives B, C, D and E

The amendment would add more management direction for considering highway crossings for wildlife, which would cumulatively increase costs.

Roads

Alternative A

The past, present and reasonably foreseeable actions listed in Appendix L have cumulatively changed the emphasis of road management, away from constructing roads, and towards keeping and improving needed roads and decommissioning unneeded roads.

Alternatives B, C, D and E

Cumulatively, the amendment in addition to the past, present and reasonably foreseeable future actions identified in Appendix L, would limit new roads open to the public in lynx habitat. The amendment would require further analysis and consideration for upgrading roads, especially those that increase traffic volumes or speeds, which could result in increased costs.

Minerals

A wide variety of mineral and energy resources occur on amendment area lands. The authority of the FS and BLM to manage mineral activities depends on the commodity and the legal status of the lands on which they occur. More information can be found in the Project Record.

Definitions

Surface-disturbing activities associated with mineral and energy resources typically include:

Prospecting
Prospecting is identifying an area with potential for mineral development. It involves limited surface disturbance, such as geologic mapping or soil or water sampling. Prospecting for oil and gas often involves collecting seismic data.

Exploration
Exploration is physically searching for minerals. It often includes building roads, drill pads, underground workings and trenching.

Development
Development is the work required to prepare a mineral deposit for production. It may include driving underground workings, stripping the overburden from deposits that will be open-pit or strip mined, building waste dumps and constructing milling and transporting facilities.

Oil and gas development includes drilling a series of production wells and building access roads.

Production
Production is removing a mineral from the ground and making it available for final processing and consumption.

Reclamation
Reclamation is restoring the areas disturbed during exploration, development and production.

Management constraints

The *status* of the land affects the legal authorities that apply to management and disposal of minerals. Land is in one of the following *status* categories:

- Lands reserved from the public domain
- Acquired lands
- Lands with outstanding or reserved rights
- Private land with federally owned minerals

Mineral resources may be classified into three categories:

- Mineral materials
- Locatable minerals
- Leasable minerals

The combination of land status and the type of mineral resource define the agency's management authority.

Mineral materials

Affected environment

Mineral materials are common minerals such as stone, gravel, clay, cinders and decorative rock, whose disposal is authorized under the Materials Act of 1947. This act provides for disposing of mineral materials on public lands through bidding, negotiated contracts or free use. The FS and BLM have full authority to make decisions about disposing of mineral materials on lands of all status categories.

The FS and BLM use mineral materials from their lands for building and surfacing system roads. The FS and BLM may sell these mineral materials, or issue free-use permits to state and county governments for public projects such as highway construction and maintenance. All contracts contain requirements for reclaiming sites to pre-mining conditions as much as possible.

There are about 2,600 active mineral-material pits on NF lands in the amendment area. In fiscal year 2000, about 800,000 tons of mineral materials worth more than $2.8 million were removed from these lands. About a quarter was removed by the FS for its own use. Demand for mineral materials is expected to grow as demand increases for public and private infrastructure.

Excavation, temporary storage and transport are associated with removing mineral materials. Typically, sites are small, less than five acres. Most are near or next to roads and do not require significant amounts of new road. They seldom overlap the high-elevation, remote places where lynx habitat occurs.

Only two to three percent of mineral-materials sites permitted in the last 15 years were in lynx habitat. Presently, only one mineral-material site in lynx habitat has winter operations.

Effects

Alternative A, no action
Management direction about mineral materials would not be changed under the no-action alternative, so there would be no effect.

Alternatives B, C, D & E
Alternatives B, C and D add management direction including Objective HU O5, Standards ALL S1 and HU S3, and Guidelines HU G4, HU G5 and HU G9 – see Table 2-1 in Chapter 2. This direction is about road use and requires considering lynx habitat needs during mineral exploration and development. Standard HU S3 is changed to a less restrictive guideline, guideline HU G 12 in Alternative E.

The effects of the action alternatives on expanding the development of existing sites would be minimal, because most are accessed by existing roads and are not in lynx habitat. Effects on new developments in lynx habitat would be minimal because the developments are generally small and the road use requirements already exist.

Locatable minerals

Affected environment

Locatable minerals such as gold, silver, copper and other metals, are subject to the General Mining Law of 1872 as amended. This law grants a statutory right to explore for and develop these minerals, unless the land has been formally withdrawn from mineral entry.

The FS manages impacts to other resources related to the exploration, development and production of locatable minerals on its lands via regulations at 36 CFR 228, Subpart A, and the BLM manages locatable minerals via regulations at 43 CFR 3809.

FS authority is directed at using the surface of NF lands (30 U.S.C. 21-54). The FS may not deny proposed operations or make them impossible by imposing unreasonably restrictive management requirements or conditions. However, the FS may require mitigation and list requirements to minimize adverse impacts.

Both BLM and FS regulations say mining operations should minimize adverse environmental impacts to surface resources. BLM regulations say to prevent "unnecessary and undue degradation" and to avoid adverse effects on threatened and endangered species. FS regulations include "taking all practicable measures" to maintain and protect wildlife habitat, and to reclaim surface disturbances including rehabilitating wildlife habitat.

FS regulations also require that roads be built and maintained to minimize or eliminate damage to other resources including wildlife. Unless otherwise authorized, roads that are no longer needed are to be closed, bridges and culverts removed, and the road surface shaped to a natural contour and stabilized.

Current situation

The amendment area has a long history of locatable hard-rock minerals activity, mostly exploring and mining for lode gold, silver, copper and other metals. Today, this usually takes place in historic mining areas, or where more recent interpretations of the geology lead to the discovery and production of economically valuable deposits.

Mining has waned since the late 1800's. Only a fraction of the historic sites operate today, and those that continue, do so with much more stringent environmental protection measures.

Most recent activity involves maintaining existing facilities – there are few new exploration and production sites. Typically, motorized vehicles use established routes for access. New access requires project-specific analysis and approval.

The majority of surface disturbances are less than 20 acres. Presently there are five larger locatable operations ranging from 100 to 600 acres on NF lands in lynx habitat in the amendment area, all in Montana. Only two are operating. The

other three are in the care-and-maintenance or reclamation phases.

Based on the minerals database maintained by FS Regions 1 and 4, which covers the last 15 years, about one-third of all Notices of Intent and Plans of Operation were for sites in lynx habitat. In fiscal year 2000, the FS processed 142 Plans of Operation and received 550 Notices of Intent.

Future locatable mineral activity is likely to occur in areas of existing operations and where the geology is favorable for economically viable mines. Significant future exploration or development is not expected; the potential for future mineral discovery is considered low.

Effects

Alternative A, no action
Management direction about locatable minerals would not be changed under the no-action alternative, so there would be no effect. Existing requirements for wildlife protection are provided in 36 CFR 228, Subpart A, which requires operators to comply with ESA. Impacts to and protection or mitigation measures for species are identified in project analysis before decisions are made about disturbance.

Alternatives B, C, D & E
Alternatives B, C and D add management direction including Objective HU O5, Standards ALL S1 and HU S3, and Guidelines HU G4, HU G5 and HU G9 – see Table 2-1 in Chapter 2. This direction requires considering lynx habitat needs during mineral exploration and development. Standard HU S3 is changed to a less restrictive guideline, Guideline HU G 12 in Alternative E.

The action alternatives do not preclude developing locatable minerals because the agencies do not have the authority to simply deny developing hard-rock mineral deposits. However they do require lynx habitat needs be considered and lynx habitat connectivity be provided. This could require additional mitigation and conditions to minimize effects on lynx, and could increase costs of development.

Leasable minerals

Affected environment

Leasable materials are federally owned fossil fuels (oil, gas, coal, oil shale, etc.), geothermal resources, sulfur, phosphates and uranium, that are subject to exploration and development under leases, permits or licenses issued by the Secretary of the Interior, with FS input on NF lands.

The 1920 Mineral Leasing Act, as amended, together with the 1989 Federal Onshore Oil and Gas Leasing Reform Act, provide the authority and management direction for federal leasable minerals on federal lands. In 1970, the Geothermal Steam Act added steam to the list of minerals that could be leased on NF lands.

Regulations at 36 CFR 228.108 require oil and gas operators to comply with ESA during operations. They require roads and surface disturbances to be reshaped and revegetated when closed or abandoned. Mining operators also are obliged to post reclamation bonds to make sure reclamation takes place. Most existing plans include standards and guidelines for reclaiming mining operations.

The National Energy Policy was issued May 18, 2002. It says:

> *"Agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health and environmental protection."*

Acquired lands (hard-rock minerals)
Hard-rock minerals described as *locatable* on public-domain lands, are described as *leasable* on lands acquired by the FS or BLM after 1891. On lands where the agencies acquired mineral as well as surface rights, the BLM issues the prospecting permits and leases for hard-rock minerals – on NF acquired lands, BLM must first obtain the consent of the FS.

Oil, gas, coal or geothermal
The BLM issues oil and gas, coal and geothermal leases. The most common leases in this area are oil and gas leases which are issued for 10-year terms. Leasing decisions and development decisions are made in two stages:

- First, the FS makes a lease decision about which lands will be open for leasing, based on an analysis of the impacts of exploration and development. This decision identifies which areas will be open to development subject to standard lease terms, which areas will be open to development subject to constraints – called *lease stipulations* – and which will be closed to leasing. The FS informs the BLM of the results and the BLM is responsible for issuing the lease.
- Then, after a lease is issued, the lessee has legal rights to explore and develop, subject to the terms of the lease and other applicable state and federal laws. The lessee must obtain approval from the BLM and FS for post-lease

activities. This is when site-specific resource protection measures developed through NEPA are applied as conditions of approval for the surface-use plan of operations. Such measures must be within the scope of the rights granted under the terms of the lease.

Solid non-energy leasable materials
The BLM also issues 10-year-term leases for solid non-energy leasable materials, such as phosphate or sodium. The FS has no consent authority, but the BLM generally accepts FS recommendations.

Current situation

The oil and gas industry has been stable during the past decade, but is projected to grow. Currently in the amendment area, about 820,000 acres are under lease for oil and gas, with more acres pending. Transmission pipelines are an integral part of the infrastructure associated with oil and gas production. Presently, there are no pipelines in lynx habitat.

During the last decade, only two wells have been drilled in lynx habitat in the amendment area. One, on the Custer NF in Montana, was plugged and abandoned. The other, on the Bridger-Teton NF in Wyoming, is in production.

Eight forests and three BLM units in the amendment area made lease-availability decisions for oil and gas. Recent estimates of foreseeable development suggest that eight more wells may be drilled in the next decade in lynx habitat – see Table K-11 in Appendix K.

All leases say that before any disturbance may occur, surveys or studies may be needed to determine the extent of impacts on resources and whether mitigation will be required.

Leases also say that if threatened or endangered species are observed during operations, the lessee shall stop doing anything that would result in the destruction of the species.

There is one solid leasable mineral operation in the amendment area on the Clearwater NF; however it is located outside lynx habitat. The Idaho Panhandle NF has received requests for garnet leases and will evaluate them during the next few years.

Effects

Alternative A, no action
Management direction about leasable minerals would not be changed under the no-action alternative, so there would be no effect. Existing requirements for wildlife protection are provided in 36 CFR 228.108(f), which requires operators to comply with ESA. Impacts to and protection or mitigation measures for species are identified in project analysis before decisions are made about disturbances.

Alternatives B, C, D & E
Alternatives B, C and D add management direction including Objective HU O5, Standards ALL S1 and HU S3, and Guidelines HU G4, HU G5 and HU G9 – see Table 2-1 in Chapter 2. This direction requires considering lynx habitat needs during exploration and development. Standard HU S3 is changed to a less restrictive guideline, Guideline HU G12 in Alternative E.

Oil and gas well development has the potential to impact lynx habitat. However, most drilling in the amendment area is done at lower elevations outside lynx habitat. Implementing the action alternatives would have little effect on oil and gas operations because, in large part, the standards and guidelines address requirements already included in regulations or existing management direction.

While the lynx amendment may increase the cost of operations in lynx habitat, it would not prohibit access to federal minerals.

The action alternatives were analyzed to see if the amendment would require more lease stipulations, but none were found. When lease proposals are received, units would see if leasing is consistent with their leasing decisions and their existing plans. This amendment would add direction that would be considered as conditions of approval when permits were being processed.

- *Standard HU S3* would require designating winter access routes for geophysical exploration in lynx habitat. Standard HU S3 also would require designating access routes during any season if exploratory wells were proposed on a lease in lynx habitat. (In Alternative E, Guideline HU G12 encourages the same actions.)
- *Guideline HU G3* would encourage avoiding ridge-top and saddle locations for new roads, which could result in higher costs but would not delay or rule out exploration.

Operators may experience some restrictions if they want to access their site during winter – the ease of movement across frozen ground makes winter exploration attractive for oil and gas.

- *Guideline HU G4* encourages using remote monitoring.
- *Guideline HU G9* encourages restricting the public's use of roads.

Both could be conditions of approval for new drilling permits.

Once a site is developed, the activity slows down. Monitoring a producing site usually involves little traffic. Some sites can be monitored remotely, using satellite technology. Oil production sites that use a pump jack or where oil is stored on-site would require regular, frequent visits.

Producing natural gas with a lift system, where the gas is directed into a flow line through a separator or dehydration unit, would not require frequent visits. Gas flow and line pressure could be monitored remotely, using solar power. Working with oil and gas operators during planning to encourage remote monitoring in the winter, may minimize snow compaction in some areas.

Adding amendment direction to existing plans would be consistent with the National Energy Policy because the direction should result in expediting permit review. The analysis shows that more stipulations are not needed to conserve lynx. The amendment direction can be applied as conditions of approval during the permit-to-drill stage – see item 18 of the *Management direction considered, not in detail* in Chapter 2.

Lands with outstanding or reserved rights

Affected environment

Private parties own some of the minerals on NF lands. Most of the NF lands in the northern Rockies were reserved from the public domain under the Forest Reserve Act of 1891. Since then, other lands have been acquired.

The titles to some of these lands are encumbered with *reservations* – sometimes the previous owner *reserved* the mineral rights. In other cases, mineral rights were separated from the surface estate before the federal government acquired the surface – these mineral rights are *outstanding* to third parties. A very small percentage of lands in the amendment area have reserved or outstanding rights.

These reserved and outstanding rights represent property interests in the land. Although the federal government owns and administers the surface, the mineral owner has certain rights as well. The most important of these is the right to access and develop the minerals. Other rights may be spelled out in individual deeds. The FS must consider these property interests during planning and implementation.

Effects

Alternative A, no action
Management direction about lands with outstanding or reserved rights would not be changed under the no-action alternative, so there would be no effect.

Alternatives B, C, D & E
Alternatives B, C, and D add Objective HU O5, Standards ALL S1 and HU S3 and Guidelines HU G4, HU G5 and HU G9 – see Table 2-1 in Chapter 2. This direction requires considering lynx habitat needs during mineral exploration and development, subject to valid existing rights. Standard HU S3 is changed to a less restrictive guideline, Guideline HU G12 in Alternative E.

The effect of the action alternatives on reserved and outstanding mineral resources is directly related to the mitigation measures designed to protect habitat for lynx.

The FS is limited in its authority to deny developing outstanding and reserved rights. Resource protection measures must be reasonable and cannot foreclose exploration or development. The management direction adopted in this amendment is not expected to significantly affect reserved or outstanding rights.

Most exploration would not experience any restrictions, because drilling and trenching are generally not done during winter when snow compaction could present a problem. If new mine development is proposed inside lynx habitat, it's possible different road locations or more mitigation would be required. This could result in higher project costs, but would not delay or rule out prospecting, exploration or development.

Cumulative effects

Alternative A
The past, present and reasonably foreseeable actions listed in Appendix L have cumulatively had a limited effect on mineral resources. Costs have likely increased due to the environmental protections required under INFISH and PACFISH. The Roadless Policy, if it were in effect, could result in changes to the areas available for mineral and energy development.

Alternatives B, C, D & E
Cumulatively the amendment, in addition to the past, present and reasonably foreseeable future actions identified in Appendix L, would add more environmental protections, potentially further increasing costs. Several of the proposed requirements are already considered in project development, so the increases are unlikely to be substantial.

Land ownership

Affected environment

The continuity of land ownership in the amendment area varies inside FS and BLM boundaries, and includes parcels of lands owned by private entities, states and other federal agencies.

In the northern Rockies, NF and BLM lands are generally fairly well connected, providing a good opportunity to maintain lynx habitat connectivity. The national forests in western Wyoming are adjacent to Yellowstone National Park, which is continuous public land not subject to development or exchange, adding to the ability to maintain lynx habitat connectivity. The amendment area includes scattered, isolated federal parcels that do not contribute to connectivity. Private lands not managed for lynx usually surround these isolated tracts.

For the FS and BLM, land ownership changes come about through land exchanges, direct purchase and conservation easements that enhance and protect wildlife habitat. The federal real estate program is active throughout the amendment area. Its purpose is to manage and conserve the public's real property for the purposes for which it was reserved from the public domain. One of its primary goals is to consolidate land ownership patterns to help more effectively and efficiently manage federal lands.

The LCAS says "… connectivity with habitats and source populations in Canada is critical to the conservation of populations in the U.S." At this time there are no natural or human-caused barriers that effectively prohibit movement of lynx between Canada and the northern Rockies (USDI FWS, 2003).

Effects

Alternative A, no action
The real estate program would not change. Land ownership adjustments would continue, but may not be a priority because of limited funding. In some areas, lynx habitat may be exchanged, and in others it may be acquired. During the next decade, the federal government plans to acquire about 375,000 acres of land. There are no cumulative effects *per se* to landownership adjustments.

Alternative B, the Proposed Action and the other action alternatives, C, D and E
The Proposed Action, Alternative B, and the other action alternatives, C, D and E, all include Guideline LINK G1, which encourages retaining federal lands in public ownership.

An active real estate program could enhance and protect lynx habitat connectivity by retaining public lands and acquiring non-federal lands. During the next decade, about 375,000 acres could be acquired through land exchanges or purchases – some of this will be lynx habitat. This estimate may change depending on landowners' willingness to exchange or sell their land. More lynx habitat could be enhanced and protected by acquiring conservation easements**.**

The continued federal ownership of scattered, isolated NF and BLM lands that do not promote connectivity for lynx would be assessed on the project level.

Special use permits

Affected environment

Forest Service direction
For the FS, *special uses* are defined in 36 CFR 251.50(a) as:

> *All uses of NFS lands, improvement and resources, except those provided for in the regulation governing the disposal of timber (Part 223) and minerals (Part 228) and the grazing of livestock (Part 222), are designated as "Special Uses."*

A special use authorization can be a permit, a term permit, a lease or an easement. There are more than 100 different kinds of special uses that can be authorized on NF lands.

BLM direction
Permission to use lands administered by the BLM for similar purposes is authorized by Title V of FLPMA, and implementation procedures are defined in 43 CFR Part 2800 – Rights of Way. Under BLM procedures, the permitted uses granted under rights-of-way are not called special uses, but the effect of the authorization is the same as on NF lands.

BLM's land special uses include but are not limited to electronic transmission and distribution lines, telephone lines, fiber optic cables, railroads, reservoirs, ditches, roads, highways, communication sites, oil and gas pipelines, hydropower projects, seismic sites for research and military exercises. Authorizations also can be issued for such things as fences.

Special use proposals are evaluated against several criteria, including

- Can the use occur on other lands
- Is the use is in the public interest
- Does the applicant have the financial and technical ability to construct and maintain the facility

Criteria for screening proposals on NF lands are found at 36 CFR 251; BLM criteria are found at 43 CFR 2802 – Applications.

A large number of requests are received each year for road access in the amendment area because private lands are often next to or inside NF or BLM boundaries. Many tracts are small and zoned by counties to allow development.

Some private tracts are *inholdings*, privately owned lands surrounded by federal lands. Inholdings are guaranteed access under ANILCA (Alaska National Interests Lands Conservation Act of 1980), which says landowners shall be authorized access "adequate to secure them the reasonable use and enjoyment of their land" (36 CFR 251.110(c)).

Effects

Alternative A
Management direction would not be changed under the no-action alternative, so there would be no effect.

Currently each special use authorization contains terms and conditions to minimize damage to wildlife habitat and protect the environment (36 CFR 251.56 (a)(i)(B) & 43 CFR 2802.4). Impacts to and protection or mitigation measures for threatened and endangered species are identified in project analysis before any decisions are made about whether disturbances will be allowed.

No cumulative effects have been noted.

Alternatives B, C, D & E
The action alternatives would add management direction including Objectives HU O3 and HU O5 and Standards ALL S1 and HU S3 – see Table 2-1 in Chapter 2. This direction requires considering lynx habitat needs in special use authorizations.

The action alternatives do not preclude special uses; however, they do require lynx habitat needs to be considered and connectivity provided.

More conditions of approval and mitigation measures to reduce effects on lynx could be required and could increase costs of development. The standards could limit the options for where access roads and authorized facilities would be located.

No cumulative effects have been noted.

Economics & social

Social and economic analyses are conducted to determine what affect land management decisions may have on local communities, economies and the people who use natural resources. This analysis considers the potential effects of the alternatives on employment, income and other financial aspects, as well as on lifestyles and other factors.

Affected environment

Population

The 2000 U.S. Census showed a population increase in the four states in the amendment area (US Census Bureau 2000). The populations of Utah and Idaho are both more than one million. Table 3-52 shows the population for these states in the last two censuses, the change from 1990 to 2000, as well as projections for the year 2015.

The 2000 census resulted in reported population densities of 15.6 people per square mile in Idaho, 6 in Montana, 27.2 in Utah and 5.1 in Wyoming. Populations are expected to continue to grow. By 2015, the population of Idaho is expected to increase 25 percent, Montana by 18 percent, Utah 20 percent and Wyoming 30 percent.

Population changes are measured by counting natural increase – births minus deaths – and migration.

The states have fairly homogenous populations. Table 3-53 on the following page shows the racial composition by state.

A number of communities in the amendment area depend heavily on natural resources from public lands, including:

Idaho
Ashton, Bonners Ferry, Clark Fork, Driggs, Dubois, Idaho Falls, Kamiah, Kooskia, Moyie Springs, Orofino, Pierce, Rexburg, Ririe, Salmon, St. Anthony, Sandpoint, Victor and Weippe;

Montana
Alberton, Columbia Falls, Darby, Deer Lodge, Drummond, Eureka, Gardiner, Libby, Lincoln, Philipsburg, Red Lodge,

Table 3-52. Past and projected population of the analysis area

	1990 Population	2000 Population	2005 Population	2015 Population	2025 Population	Change 1990 to 2000 Number	Change 1990 to 2000 Percent
Idaho	1,006,749	1,293,953	1,480,000	1,622,000	1,739,000	287,204	28.5%
Montana	799,013	902,195	1,006,000	1,069,000	1,121,000	103,182	12.9%
Utah	1,722,850	2,233,169	2,411,000	2,670,000	2,883,000	510,319	29.6%
Wyoming	453,588	493,782	568,000	641,000	694,000	40,194	8.9%
U.S.	248,709,873	281,421,906	285,980,000	310,133,000	335,048,000	32,712,033	13.2%

Source: U.S. Bureau of the Census

Rexford, Seeley Lake, Superior, Thompson Falls, Troy and West Yellowstone;

Utah
Kamas and Vernal; and

Wyoming
Buffalo, Evanston, Green River, Greybull, Jackson, Kemmerer, Lovell, Rock Springs and Worland.

Demographic trends
Several demographic trends will impact the amendment area in the next few decades. The first and most notable is that during the next 25 years, the West is expected to grow at nearly twice the national average rate.

The second trend, common to all states, is the aging of the population (Campbell 1996). The percent of people under 20 years of age will decrease, and the percent over 65 will increase during the next 30 years. After the year 2010, the elderly proportion will increase rapidly as the "baby boomers" born between 1946 and 1964 finally begin to reach retirement age. Utah, Idaho and Wyoming are projected to be among the states with the most rapid growth in this segment, with national rankings anticipated to be second, third and sixth respectively.

The third trend is the increasing level of participation in outdoor recreation, and the tendency for each succeeding generation during the last century to increase its level of participation (USDA 1997). It's expected that the "baby boomers" will continue this trend, having been exposed to a broader range of outdoor activities then were their parents.

Economic

The four states in the amendment area constitute a very large land area containing many "economies" as defined by Bureau of Economic Analysis classification system (USDC 1995). The information describing the economic environment is presented at the state level.

Employment
Figure 3-8 displays employment growth for full- and part-time workers (for both proprietors, and wage and salary) of major industries by state over the last 31 years (USDC 2002).

Table 3-53. Year 2000 population race by state

	Population	White	American Indian/ Alaska Native	Asian	Black/ African American	Other*
Idaho	1,293,953	91%	1%	1%	<1%	7%
Montana	902,195	90%	6%	<1%	<1%	2%
Utah	2,233,169	89%	1%	2%	1%	7%
Wyoming	493,782	92%	2%	<1%	1%	4%

*Native Hawaiian and other Pacific Islanders, some other race, or two or more races.
Source: U.S. Census Bureau, Census 2000

Idaho

In 1969 in Idaho, the largest major industry employer was government, with about 59,500 jobs statewide. By 1999, four industries accounted for more than half the employment – services, retail trade, government and manufacturing. Services were the largest at about 199,260 jobs and mining the smallest, with only 3,261 jobs. In 1999, employment not including farming totaled about 761,000 jobs statewide.

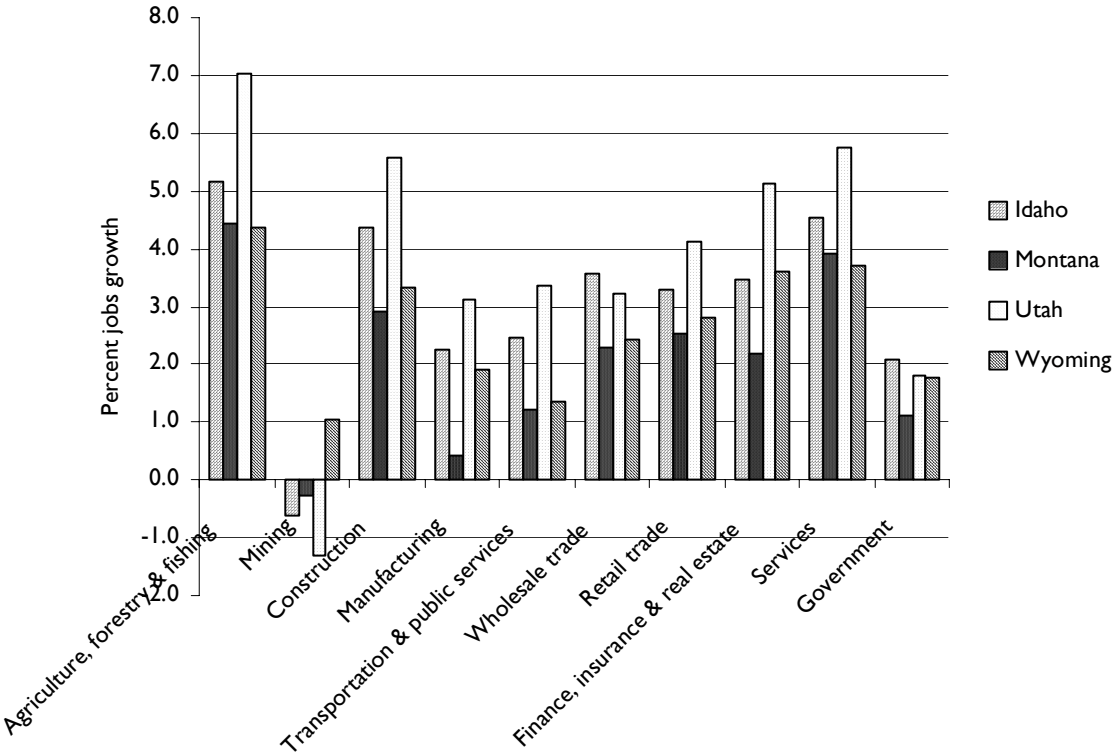
From 1969 to 1999, all sectors (except mining) experienced positive average annual employment growth, ranging from -0.6 percent for mining, to 5.2 percent for agriculture, forestry and fishing.

Montana

In 1969 in Montana, the largest major industry employer was government, with about 60,000 jobs statewide. By 1999, three industries accounted for more than half the employment – services, retail trade and government. Services were the largest at about 168,000 jobs and mining the smallest, with only about 6,500 jobs. In 1999, employment not including farming totaled about 520,000 jobs statewide.

From 1969 to 1999, all sectors (except mining) experienced positive average annual employment growth, ranging from -0.3 percent for mining, to 4.5 percent for agriculture, forestry and fishing.

Figure 3-8. Average annual rate of job growth, 1969-1999



Utah
In 1969 in Utah, the largest major industry employer was government, with about 114,000 jobs statewide. By 1999, four industries accounted for more than half the employment – services, retail trade, government and manufacturing. Services were the largest at about 406,200 jobs and mining the smallest, with only about 8,800 jobs. In 1999, employment not including farming totaled about 1,335,000 jobs statewide.

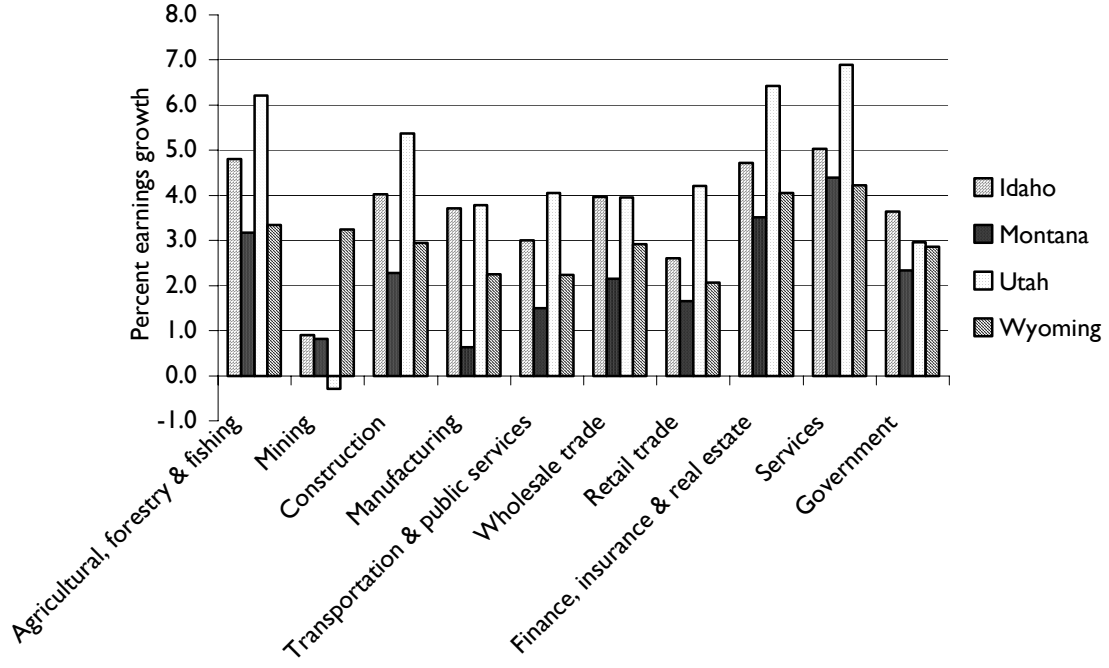
From 1969 to 1999, all sectors (except mining) experienced positive average annual employment growth, ranging from -1.3 percent for mining, to 7.0 percent for agriculture, forestry and fishing.

Wyoming
In 1969 in Wyoming, the largest major industry employer was government, with about 36,700 jobs, and total private employment at about 143,600 jobs. By 1999, three industries accounted for more than half the employment – services, government and retail trade. Services were the largest at about 82,300 jobs and agriculture, forestry and fishing the smallest, with only about 4,700 jobs. In 1999, employment not including farming totaled about 309,400 jobs statewide.

From 1969 to 1999, all sectors experienced positive average annual employment growth, ranging from 1.0 percent for mining, to 4.4 percent for agriculture, forestry and fishing.

Earnings
Figure 3-9 shows the average annual earnings growth between 1969 and 1999 by major industry by state (USDC 2002). All earnings data have been inflation

Figure 3-9. Average annual rate of earnings growth, 1969-1999



adjusted to year 2000 dollars. Earnings (wages and salaries, other labor income and proprietors' income) are useful in analyzing regional economies, since they are a proxy for income generated from participation in current production.

Idaho

All the major industries in Idaho experienced positive earnings growth in real dollars from 1969 to 1999. The average annual earnings growth ranged from 5.0 percent for services, to 4.8 percent for agriculture, forestry and fishing, to 0.9 percent for mining. Even though mining saw a decline in employment, the jobs remaining experienced some earnings growth in inflation-adjusted terms. Services grew the fastest and mining grew the slowest.

Montana

All the major industries in Montana experienced positive earnings growth in real dollars from 1969 to 1999. Again, though mining saw a decline in employment, the jobs remaining experienced some earnings growth in inflation-adjusted terms. Finance and services grew the fastest, and manufacturing and mining grew the slowest.

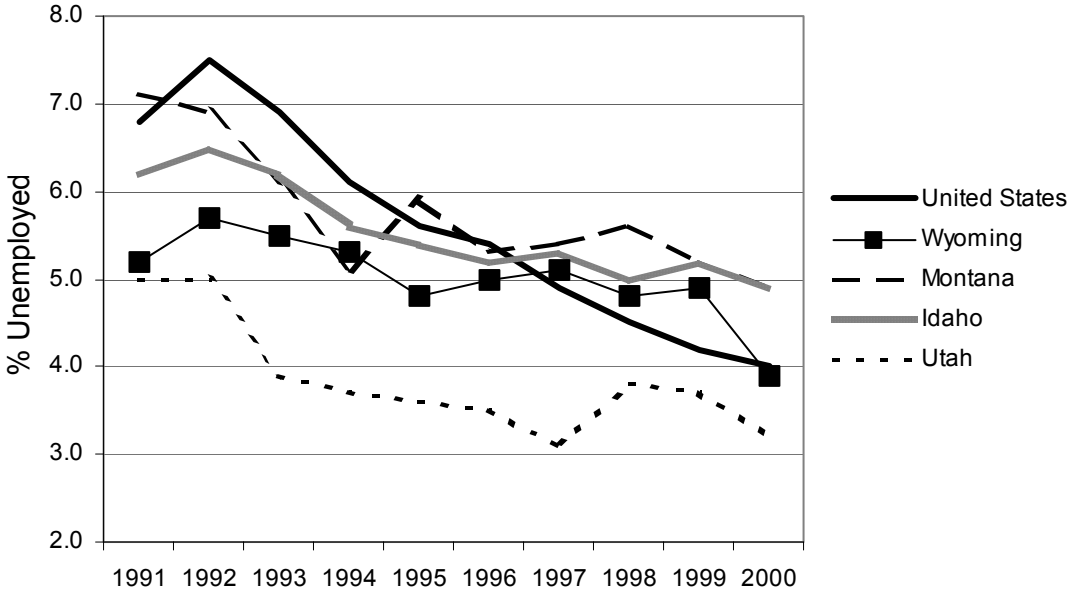
Utah

All the major industries in Utah experienced positive earnings growth in real dollars from 1969 to 1999, except for mining. The average annual earnings growth ranged from -0.3 percent for mining to 6.9 percent for services.

Wyoming

All the major industries in Wyoming experienced positive earnings growth in real dollars from 1969 to 1999. The average annual earnings growth ranged from 2.1 percent for retail trade to 4.2 percent for services.

Figure 3-10. Unemployment rates



Unemployment

Figure 3-10 displays the unemployment rates for the states within the amendment area compared to the country as a whole (USDL 2002). The unemployment rate is the percentage of the labor force that's not working, but is actively seeking work. The unemployment rate for each state quantifies the magnitude of joblessness. The U.S. rate is included as a point of reference to better understand how unemployment in the amendment area compares to the situation at the national level.

In general, the trend for unemployment during the 1990's was one of decline. The chart shows unemployment rates for each state as a whole – state-level data can mask the variability found at the county level. In the amendment area, counties with the highest unemployment rates tend to be rural.

Personal income

Personal income is generally seen as a key indicator of a region's economic vitality. It includes all sources of income – income from work (labor income), income from private investments (dividends, interest and rent) and income from government transfer payments (Social Security, retirement, disability, Medicare and Medicaid).

Table 3-54 shows the total personal income for 1999, and its average annual growth from 1969 to 1999 by state (USDC 2002). To further measure the economic vitality of an area, divide personal income by the population, yielding per-capita personal income. Per-capita personal income was inflation adjusted to year 2000 dollars.

Table 3-54 also shows how the components of personal income have changed over the last thirty years.

- The earnings share has declined, indicating labor income has become a smaller component of personal income.
- The transfer payments share has increased, indicating payments from the government have increased substantially.

Idaho

- In 1999, per capita personal income was $23,292, an increase of about 2.9 percent from the previous year, averaging 2.0 percent annual growth from 1969 to 1999 in inflation-adjusted dollars.

Table 3-54. Personal income by state, 1969 to 1999

	Personal Income (billions)	Average annual growth	Per capita increase		As a percentage of total personal income					
					Earnings		Transfer payments		Investment income	
	1999	1969-1999	1969-1999	1998-1999	1969	1999	1969	1999	1969	1999
Idaho	$29.2	3.9%	2.0%	2.9%	79.1%	68.0%	8.3%	12.8%	12.7%	19.2%
Montana	$19.8	2.7%	1.8%	1.8%	75.6%	60.7%	9.1%	15.6%	15.3%	23.8%
Utah	$50.5	4.7%	2.2%	3.0%	80.1%	72.3%	7.5%	10.2%	12.3%	17.5%
Wyoming	$12.9	3.5%	2.2%	4.3%	77.3%	61.9%	7.4%	12.0%	15.3%	26.1%

Montana

- In 1999, per capita personal income was $22,400, an increase of about 1.8 percent from the previous year, averaging 1.8 percent annual growth from 1969 to 1999 in inflation-adjusted dollars.
- Dividends, interest and rent also have increased.

Utah

In 1999, per capita personal income was $23,705, an increase of about 3.0 percent from the previous year, averaging 2.2 percent annual growth from 1969 to 1999 in inflation-adjusted dollars.

Wyoming

In 1999, per capita personal income was $26,849, an increase of about 4.3 percent from the previous year, averaging 2.2 percent annual growth from 1969 to 1999 in inflation-adjusted dollars.

Effects

Each alternative was evaluated to determine what affect it would have on employment and labor income in the four states in the amendment area.

Economic effects

The largest effect to the amendment area's economy comes from the proposed restrictions on precommercial thinning in Standard VEG S5, found in all the action alternatives.

Economic effects of precommercial thinning

During the last five years, contractors have performed about 80 percent of the precommercial thinning work done by the FS and BLM. There's not a specific economic industry sector defined for precommercial thinning – instead, its economic activity is recorded as part of the agriculture, forestry and fishing sector. Unfortunately, we cannot identify how much precommercial thinning contributes to this sector.

In 1999, the agriculture, forestry and fishing sector amounted to the following percentage of total state employment in the amendment area:

- Idaho, 2.4 percent
- Montana, 1.6 percent
- Utah, only 0.8 percent
- Wyoming, 1.5 percent

Analysis procedures

Economic effects can be categorized as direct, indirect and induced. Direct effects are changes associated with the initial effects of a program. Indirect and induced effects are ripple effects resulting from subsequent rounds of spending in the economy.

An input-output analysis was used to estimate the job and labor income effects stemming from precommercial thinning. The analysis traced the links between economic sectors and calculates the economic effects resulting from a direct impact on the economy.

Input-output analysis requires identifying an economic impact area. Functional economic areas provided by the Bureau of Economic Analysis guided development of the 18 economic areas used in this analysis. More information can be found about impact areas in the economics report in the Project Record.

The IMPLAN Pro analysis system and 1999 IMPLAN data were used to develop the input-output models for this analysis (IMPLAN Professional 1999). For each of the impact areas, estimates were made of the jobs and labor income stemming from the precommercial thinning operations defined in the alternatives.

Funding precommercial thinning

To develop precommercial thinning costs, first each of the FS and BLM field offices developed precommercial thinning plans for the next decade for each alternative. Next they provided their thinning costs per acre. Then the total thinning costs were calculated for each alternative.

Two scenarios were developed, one based on full funding and the other based on an average of past funding. The full-funding

scenario assumes Congress would allocate enough money to do all the precommercial thinning planned.

The average-funding scenario assumes an amount based on past funding. Historically the precommercial thinning program has not been fully funded – funding has varied from year to year. From 1994 to 1998 (the five years before lynx became an issue), amendment-area forests received funding to do an average of 34 percent of the precommercial thinning planned, about 20,000 acres a year. This is the basis for the average-funding scenario.

It could be assumed that funding for about 20,000 acres a year would continue. But experience has shown funding is allocated in direct proportion to what's requested, so it is more likely that a percent of what's requested would be funded. If precommercial thinning requests were severely curtailed by Standard VEG S5, there could be an even more significant drop in the dollars allocated to do the work.

Historically, the BLM units have received enough money to fully fund their programs. Their programs have been very limited.

The effects are presented first for the average-funding scenario of about 20,000 acres, then for the full-funding scenario.

In both cases, Alternative A, no action, provides a baseline for comparison, because it shows the amount of precommercial thinning that could be done if no restrictions were applied to conserve lynx habitat.

Average funding

Table 3-55 shows the acres that would be precommercially thinned during the next decade by alternative and state, assuming the average-funding scenario of about 20,000 acres a year.

Table 3-56 on the following page displays the employment and labor income effects of the alternatives over a decade by state, assuming average funding.

The economic effects shown here are total effects – direct, indirect and induced. The economic effects consist of jobs and income tied directly to thinning, plus ripple effects from industries supporting

Table 3-55. Precommercial thinning* by alternative after a decade of average funding

	Alternative A	Alternative B	Alternatives C & E	Alternative D
Idaho	76,410 acres	23,360 acres	23,370 acres	50,420 acres
Montana	100,910 acres	33,000 acres	33,510 acres	77,120 acres
Utah	3,180 acres	410 acres	410 acres	700 acres
Wyoming	13,030 acres	5,180 acres	5,180 acres	10,180 acres
BLM (Idaho only)‡	4,740 acres	3,930 acres	3,930 acres	3,930 acres
Totals	198,270 acres	65,880 acres	66,400 acres	142,350 acres

*Acres shown are both in and out of lynx habitat – reductions are all taken inside lynx habitat

‡ No precommercial thinning is planned on BLM lands in Utah

Table 3-56. Economic effects by alternative after a decade of average funding

	Alternative A		Alternative B		Alternatives C & E		Alternative D	
	Jobs	Income M$	Jobs	Income M$	Jobs	Income M$	Jobs	Income M$
Idaho	849	$10,905	281	$3,666	281	$3,668	476	$6,298
Montana	861	$7,916	287	$2,631	291	$2,674	556	$5,090
Utah	10	$129	1	$17	1	$17	2	$28
Wyoming	110	$1,229	44	$508	44	$508	89	$997
Totals	1,830	$20,179	613	$6,822	617	$6,866	1,123	$12,413

thinning. Table 3-57 compares the economic effects of the alternatives, assuming average funding for decade.

It's important to note again that it's impossible to predict what the actual funding would be. The differences between the alternatives would not be as great if we could be sure that 20,000 acres would be funded.

Full funding

Table 3-58 on the following page shows the acres that would be precommercially thinned during the next decade by alternative and state, if Congress appropriated enough money to do all the thinning planned. This would be a substantial increase compared to the existing situation because the precommercial thinning program has never been fully funded.

Table 3-59 on the following page displays the employment and labor income effects of the alternatives over a decade by state, assuming full funding.

Again, the economic effects here are totals – direct, indirect and induced – comprising jobs and income tired directly to thinning, plus ripple effects from supporting industries. Table 3-60 compares economic effects after a decade of full funding.

Table 3-57. Comparison of economic effects after a decade of average funding

	Number of jobs			Labor income M$		
	B vs A	C&E vs A	D vs A	B vs A	C&E vs A	D vs A
Idaho	-568	-568	-373	-$7,239	-$7,237	-$4,607
Montana	-574	-570	-305	-$5,285	-$5,242	-$2,826
Utah	-9	-9	-8	-$112	-$112	-$101
Wyoming	-66	-66	-21	-$721	-$721	-$232
Totals	-1,217	-1,213	-707	-$13,357	-$13,313	-$7,766

Table 3-58. Precommercial thinning* by alternative after a decade of full funding

	Alternative A	Alternative B	Alternatives C & E	Alternative D
Idaho	226,980 acres	70,280 acres	70,320 acres	153,930 acres
Montana	315,310 acres	103,070 acres	104,700 acres	240,970 acres
Utah	8,580 acres	1,100 acres	1,100 acres	1,880 acres
Wyoming	25,350 acres	8,630 acres	8,630 acres	20,590 acres
BLM (Idaho)‡	4,740 acres	3,930 acres	3,930 acres	3,930 acres
Totals	580,960 acres	187,010 acres	188,680 acres	421,300 acres

*Acres shown are both in and out of lynx habitat – reductions are all taken inside lynx habitat
‡ No precommercial thinning is planned on BLM lands in Utah

Table 3-59. Economic effects by alternative after a decade of full funding

	Alternative A		Alternative B		Alternatives C & E		Alternative D	
	Jobs	Income M$	Jobs	Income M$	Jobs	Income M$	Jobs	Income M$
Idaho	2,423	$31,286	758	$9,978	758	$9,984	1,361	$18,089
Montana	2,692	$24,737	894	$8,223	910	$8,353	1,738	$15,829
Utah	27	$349	3	$45	3	$45	6	$76
Wyoming	219	$2,459	73	$847	73	$847	184	$2,072
Totals	5,361	$58,831	1,728	$19,092	1,744	$19,228	3,289	$36,065

Table 3-60. Comparison of economic effects after a decade of full funding

	Number of jobs			Labor income M$		
	B vs A	C&E vs A	D vs A	B vs A	C&E vs A	D vs A
Idaho	-1,665	-1,665	-1,062	-$21,309	-$21,303	-$13,198
Montana	-1,798	-1,782	-954	-$16,515	-$16,384	-$8,909
Utah	-24	-24	-21	-$304	-$304	-$272
Wyoming	-146	-146	-35	-$1,612	-$1,612	-$387
Totals	-3,633	-3,617	-2,072	-$39,739	-$39,603	-$22,766

Alternative A, no action
Table 3-55 shows that under the no-action alternative, if for the next decade the precommercial thinning program was funded at about 20,000 acres a year (the average-funding scenario), about 200,000 acres would be thinned, representing about 180 jobs per year and about $20 million in labor income.

Table 3-58 shows that under the no-action alternative, if for the next decade the precommercial thinning program was fully funded, about 580,000 acres would be thinned, representing about 540 jobs per year and about $60 million in labor income. This would be a considerable increase above the existing situation, because the precommercial thinning program has never been fully funded.

Under either funding scenario, most of the jobs and labor income effects would occur in Montana and Idaho, where most of the precommercial thinning is planned.

Alternative B, C & E
These three alternatives have similar effects, so they are discussed together. Alternative B would defer precommercial thinning until stands no longer provide snowshoe hare habitat. Alternatives C and E are identical in terms of precommercial thinning – both would defer precommercial thinning until stands no longer provide snowshoe hare habitat, with some minor exceptions.

Table 3-55 shows that under Alternatives B, C or E, if for the next decade the precommercial thinning program was funded at about 20,000 acres a year (the average-funding scenario), about 130,000 of the 200,000 acres planned would not be thinned because they are in lynx habitat. These alternatives each would represent about 61 jobs per year and about $700,000 in labor income under the average-funding scenario.

Compared to the no-action alternative under the average-funding scenario, Alternatives B, C or E would represent a loss of about two-thirds of the jobs and labor income. The effect would be felt most in those rural communities named in the Affected Environment portion of this report, communities that tend to experience a higher unemployment rate. The communities most affected are in the seven NF's experiencing 80 percent of the reduction, the Idaho Panhandle, Salmon-Challis and Targhee NF's in Idaho, and the Beaverhead-Deerlodge, Flathead, Kootenai and Lolo NF's in Montana. See Tables K-14 and K-17 in Appendix K for a breakdown by unit.

Alternative D
Alternative D would defer precommercial thinning under certain circumstances and conditions.

Table 3-55 shows that under Alternative D, if for the next decade the precommercial thinning program was funded at about 20,000 acres a year (the average-funding scenario), about 55,000 of the 200,000 acres planned would not be thinned because they are in lynx habitat. Alternative D would represent about 110 jobs per year and about $1.3 million in labor income under the average-funding scenario.

Compared to the no-action alternative under the average-funding scenario, Alternative D would represent a loss of

about one-third of the jobs and labor income. This would be only about half the reductions expected under Alternatives B, C and E. The communities most affected would be the same as under Alternatives B, D and E.

Economic effects of snowmobling

Table 3-61 shows the trend in the number of registered snowmobiles in amendment area states. This information is useful in gauging the popularity of snowmobiling, an outdoor activity for which precise estimates of use over time are difficult to obtain. The data indicates an upward trend in all states.

Idaho

The Department of Resource Recreation and Tourism at the University of Idaho conducted a study of winter sports in Idaho during the winter season of 1994-1995 (Parrish, Leidner, Hunt & Sanyal 1994). This study was not designed to collect economic information, so estimates of economic effects are not available for snowmobiling in Idaho.

Montana

The Bureau of Business and Economic Research (BBER) at the University of Montana studied the economic contributions of snowmobiling in Montana in 1988, 1994 and 1998. According to the 1998 BBER report, during the winter 1997-1998, between 9 and 14 percent of Montana residents participated in snowmobiling – this amounts to 1.1 million activity days for Montana resident snowmobilers. BBER estimated more than 222,000 non-resident activity days.

The Montana resident and non-resident days combined amounted to 1.3 million snowmobile activity days, greater than the total at downhill ski areas, which amounted to about 1 million days.

Table 3-62 on the next page shows the spending profiles for snowmobilers in Montana during the winter of 1997-1998. Resident snowmobilers spent about $54 per person per activity day and non-residents spent about $200.

Resident snowmobilers spent about $60 million during the same period for daily personal expenses. Residents spent the most on gasoline, amounting to $22.8 million or 38 percent. Residents spent the next most on eating and drinking, amounting to just under $12 million or about 20 percent.

Table 3-61. Growth in number of snowmobiles registered by state

	Registered snowmobiles		Average growth	
	1989 – 1991	2000 – 2001	Registered snowmobiles	State population
Idaho	22,300 in 1989	47,500 in 2000	7.1%	2.5%
Montana	15,100 in 1991	24,600 in 2001	5.0%	1.2%
Utah	12,800 in 1990	29,400 in 2001	7.9%	2.6%
Wyoming	15,300 in 1989	18,200 in 2000	1.6%	0.8%

Data from Idaho Department of Motorized Vehicles; Montana Department of Fish, Wildlife & Parks; Utah State Parks & Recreation Department; and Wyoming State Parks & Trails Department

Table 3-62. Spending in Montana by resident and non-resident snowmobilers in 1997-1998

Item	Per person per day			
	Resident		Non-resident	
Gas for snowmobiles	$10.15	18.6%	$12.76	6.4%
Gas for transportation	$10.55	19.4%	$14.39	7.3%
Lodging	$8.55	15.7%	$70.28	35.5%
Eating & drinking	$10.87	19.9%	$49.02	24.7%
Grocery & convenience stores	$5.63	10.3%	$9.48	4.8%
Entertainment & recreation places	$1.06	1.9%	$9.51	4.8%
Snowmobile dealers	$6.13	11.3%	$18.02	9.1%
Other retail	$1.46	2.7%	$12.11	6.1%
Other	$0.11	0.2%	$2.51	1.3%
Daily totals	$54.51	100%	$198.08	100%

Non-resident snowmobilers spent more than $44 million during the winter of 1997-1998 for daily personal expenses in Montana. About $16 million, or 36 percent, was spent on lodging, and $11 million, or 25 percent, in restaurants and drinking establishments.

Utah

The Institute of Outdoor Recreation and Tourism at Utah State University studied the economic impact of resident snowmobilers in Utah during the winter of 1999-2000 (McCoy, Fujisaki, Blahna & Keith 2001). Table 3-63 shows residents spent about $19.7 million on trip-related expenses, with an average of about $127 per trip.

Most money was spent repairing or maintaining snowmobiles. The second and third most was spent on gasoline for the snowmobiles and towing vehicles. Since only residents were surveyed,

Table 3-63. Spending in Utah by resident snowmobilers in 1999-2000

Item	Per trip	
Gas for snowmobiles	$31.03	24.5%
Gas for transportation	$22.40	17.6%
Lodging	$6.39	5.0%
Eating & drinking	$8.50	6.7%
Grocery & convenience stores	$13.28	10.5%
Parking area fees	$1.07	0.8%
Other recreation activities	$0.79	0.6%
Snowmobile rental, tour packages, or guide services	$0.75	0.6%
Repair or maintenance of snowmobiles	$36.86	29.1%
Retail items	$5.67	4.5%
Other	$0.13	0.1%
Total per trip	$126.87	100%

Table 3-64. Spending in Wyoming by non-resident snowmobilers in 2000-2001

	Per person per day	
Lodging	$35.17	35.5%
Eating & drinking	$21.90	22.2%
Grocery/liquor	$6.17	6.2%
Gasoline	$17.73	17.9%
Oil/repair	$3.28	3.3%
Retail	$6.02	6.1%
Snowmobile rental	$3.06	3.1%
Guided tours	$2.80	2.8%
Other recreation	$0.94	1.0%
Other purchases	$1.92	1.9%
Totals	$98.99	100%

spending on food and lodging was relatively low.

Direct employment and labor income derived from the $19.7 million was estimated to be 171 jobs and $3.3 million in labor income in Utah. The total economic effect – direct plus indirect – was estimated at 259 jobs, representing $5.5 million in labor income.

Wyoming

The Department of Agricultural and Applied Economics at the University of Wyoming published a report in October 2001 reporting findings of an economic assessment of snowmobiling in Wyoming (McManus, Coupal & Taylor 2001). The study included residents, non-residents and the clients of outfitters. Economic impacts were developed only for non-residents and outfitter clients, since they bring new dollars into the state's economy.

Residents spent $69 per person per day. Total resident spending was about $94.4

Table 3-65. Spending in Wyoming by snowmobile outfitter clients in 2000-2001

	Per person per day	
Lodging	$32.58	18.1%
Eating & drinking	$19.91	11.0%
Grocery/liquor	$3.73	2.1%
Gasoline	$6.78	3.8%
Oil/repair	$1.19	0.7%
Retail items	$13.78	7.7%
Snowmobile rental	$18.24	10.1%
Snowmobile tours	$20.93	11.6%
Guided tours	$52.12	28.8%
Other recreation	$6.89	3.8%
Other purchases	$4.11	2.3%
Totals	$180.27	100%

million, which accounted for $4.5 million in state and local government revenue.

Non-residents spent $98.99 per person per day in Wyoming. Total non-resident spending was about $97.6 million. Table 3-64 on the previous page shows the economic impact of non-resident spending was estimated to be 2,482 jobs, representing $34.4 million in labor income.

Outfitter clients spent $180.27 per person per day, or about $40.8 million. Table 3-65 on the previous page shows the economic impact from outfitter clients alone amounted to 1,335 jobs and $15.9 million in labor income.

Alternative A, no action
An increasing trend in snowmobile use is likely. Since Alternative A would impose no change to winter recreation opportunities, it would have no effect on the economic contributions of snowmobiles.

Alternative B, the Proposed Action
Alternative B would allow no net increase in designated over-the-snow routes. Grooming could expand on routes currently designated. New or expanded special use authorizations or agreements would be limited to existing designated routes and areas. Some outfitters could be affected on a local basis.

However, there would be no restrictions preventing the public from expanding use anyplace identified on a travel plan map as open to motorized use. Therefore, there would be no effect on the economy.

Alternative B would not change the contributions of snowmobiling to the economy, and the current level of use is likely to continue.

Alternatives C, D & E
Alternatives C, D and E would allow no net increase in designated over-the-snow routes, except where existing use already is concentrated. Grooming could expand on routes currently designated. Alternatives C, D and E would allow some expansion, so they are unlikely to result in localized effects on outfitters.

Like Alternative B, Alternatives C, D and E would place no restrictions preventing the public from expanding use, so there would be no effect on the economy.

Alternatives C, D and E would not change the current economic contributions of snowmobiling and is unlikely to change growth trends, since some expansion of routes is anticipated.

Economic effects of downhill and cross-country skiing

Information about the economic contribution of ski areas and cross-country skiing could not be established, so an economic analysis was not done. NEPA says that when information is incomplete and unavailable, "… the agency shall always make clear that such information is lacking" (40 CFR 1502.22). The available information was presented in the *Recreation* section.

Nevertheless, all the action alternatives would have negligible effects on skiing. The action alternatives could increase some costs associated with developing or expanding ski areas, but would not result in preventing new or expanding existing areas. It's unlikely the increased costs

would be a significant adverse effect on ski area development or expansion.

Economic effects from other standards & guidelines

Alternative A, no action
Under the no-action alternative all sectors except mining would likely continue their present positive average annual employment growth rates.

Alternative A would have no effect on or change the economic contributions of outfitters, livestock grazing or mineral resource management. Therefore, it would not have an economic effect on these industries.

Effects common to Alternatives B, C, D & E
Action Alternatives B, C, D and E would have a negligible economic effect on grazing, ski areas and mining. The standards do not rule out developing new or managing existing grazing allotments, ski areas or mineral resources. However, managing to provide for lynx habitat needs could result in increased costs. For example:

- Grazing allotment costs may increase because Standard GRAZ S3 requires what may be new direction in some cases for managing livestock in riparian areas;
- Costs for new or expanding ski areas may increase because under Alternative B's Standard HU S2 requires and under Alternatives C, D and E's Guideline HU G10 suggests that when new trails, access roads and lift termini are planned, they should be located to provide lynx diurnal security habitat; and
- Costs for oil and gas leasing may increase because Guideline HU G4 recommends monitoring wells remotely. However, remote monitoring may be cheaper in the long term.

Social effects

Social impacts are described in terms of social well-being. Factors that can affect social well-being include the availability, amount and quality of resources such as recreation and economic opportunities.

Public concerns expressed in response to the proposed action ranged from strong opposition to strong support. Some people were concerned that the proposal would reduce motorized recreation opportunities and be unfair to the elderly, disabled and families with young children. Others were concerned it might close off family-oriented recreation opportunities such as cross country skiing and snowmobiling or result in losing access to public lands.

Social effects of precommercial thinning

Alternative A, no action
Alternative A, no action, would not change the current social environment or employment opportunities, so there would be no social effects.

Alternatives B, C, D & E
All the action alternatives would result in fewer employment opportunities in communities associated with the Idaho Panhandle, Salmon-Challis and Targhee NF's in Idaho, and the Beaverhead-Deerlodge, Flathead, Kootenai and Lolo NF's in Montana. Compared to no action,

Alternatives B, C and E would result in a reduction of about two-thirds of the jobs stemming from precommercial thinning under the average-funding scenario, and Alternative D would result in about one-third. If the selected alternative were funded close to the 20,000-acre historic average, then employment opportunities would be more similar to no-action.

Social effects of snowmobiling

Alternative A, no action
Alternative A would not change the current social environment or employment opportunities or what routes were available for over-the-snow activities or their potential to expand, so there would be no social effects.

Alternative B, the Proposed Action
Under Alternative B, use levels may increase on existing groomed routes, so user experience likely would change.

General use in places identified on travel plan maps as open for motorized use would not be affected by the alternative. But in some places, most probably the NF's immediately adjacent to Yellowstone National Park, it could affect future levels of general use, due to increased use on existing designated trails, and therefore change user experience. The average growth in snowmobile use could level out.

Alternatives C, D & E
Under Alternatives C, D and E, groomed routes could increase, so there should be no change in user experience. General use in places identified on travel plan maps as open for motorized use would not be affected, so there should be no change in user experience.

Social effects from other standards & guidelines

Action Alternatives B, C, D and E would have a negligible social effect on grazing, ski areas and mining. The standards do not rule out developing new or managing existing grazing allotments, ski areas or mineral resources. However, managing to provide for lynx habitat needs could result in increased costs. For example, the cost of a ski pass could increase and the amount of area available for ski area expansion or development could reduce. This could affect skier satisfaction in the long-term.

Cumulative effects

The cumulative effects analysis focused on the additive changes of past, present and reasonably foreseeable future programmatic actions. Appendix L identifies these actions and describes how they could contribute cumulatively to social and economic consequences.

Alternative A
Past, present and reasonably foreseeable programmatic decisions have been affecting local economies and social well-being, especially small rural communities with economies that depend heavily on natural resources from public lands.

Communities in the Idaho Panhandle, Salmon-Challis and Targhee NFs in Idaho, and the Beaverhead-Deerlodge, Flathead, Kootenai and Lolo NFs in Montana, have been most affected.

Alternatives B, C, D & E
The past, present and reasonably foreseeable programmatic decisions, in addition to the lynx amendment, may cumulatively affect local economies, especially small, rural communities with economies that depend heavily on natural resources from public lands.

Those communities are the places most likely to experience social and economic cumulative effects resulting from the reductions in precommercial thinning in Alternatives B, C and E. There would be less effect from Alternative D because there is less reduction in the precommercial thinning program.

Civil rights and environmental justice

No civil rights effects associated with age, race, creed, color, national origin or gender have been identified.

During the course of this analysis, potential impacts to minority populations were considered. Tribes with aboriginal territories in the analysis area were identified and contacted both formally and informally.

No alternative considered resulted in any identifiable effects or issues specific to any known minority or low-income population or community.

The agencies have considered input from all persons and groups, regardless of age, race, income status or other social and economic characteristics.

Other required disclosures

The alternatives are programmatic in nature, consisting of direction that would be applied to future management activities. They do not prescribe site-specific activities on the ground. Standards in the alternatives do not allow more actions that could affect the environment than existing plans do.

American Indian Religious Freedom Act and tribal treaty rights
No effects on American Indian social, economic, or subsistence rights are anticipated.

Prime farmland, rangeland or forestland
None of the alternatives would adversely affect prime farmland or rangeland. National Forest System lands are not considered prime forestland.

Effects on floodplains or wetlands
None of the alternatives would adversely affect floodplains or wetlands. Existing management direction for these resources would be maintained.

Effects on heritage resources
Heritage resources include areas, sites, buildings, art, architecture, memorials, and objects that have scientific, historic, or cultural value. They link people to their cultural history, provide insight into how people lived in the past, and reveal past and ongoing relationships between people and the natural world.

The NHPA (National Historic Preservation Act) and its implementing regulations require that federal agencies consider the effects of their undertakings on historic properties. The term historic properties refer to cultural properties that have been determined eligible for the NRHP (National Register of Historic Places).

Federal agencies must also consider American Indian traditional use, belief system, religious practices and lifeway values as directed by the Archeological Resource Protection Act of 1979, the NHPA, the Native American Graves Protection and Repatriation Act and the AIRFA (American Indian Religious Freedom Act). Traditional American Indian cultural properties and natural features are potentially eligible to the NRHP. Contemporary use sites for traditional or cultural purposes are provided protection under AIRFA.

The alternatives do not propose management direction that affects heritage resources. When site-specific projects are proposed, a cultural inventory of some degree would be conducted to prevent damage, mitigate unforeseen damage, or prevent impacts to sites in compliance with applicable requirements.

Effects on water quality
Section 303(d) of the Clean Water Act requires States to evaluate water quality in light of state water quality standards, report those stream segments that are impaired, and require development of

total maximum daily load of pollutants. The states in the amendment area have identified impaired stream segments on NF and BLM lands and they are working with the agencies to determine how to reduce pollutants impacts and meet total maximum daily load requirements.

The alternatives encourage the use of fire to restore ecosystems; however, they do not change management allocations to allow fires to burn in new areas. The alternatives could result in fewer ground disturbing activities such as less precommercial thinning, and could result in additional protection of riparian areas from grazing. Therefore, the alternatives would not indirectly result in further degradation of 303(d) listed waters.

Effects on special areas
Special areas include Wilderness areas, proposed wilderness, Wild and Scenic and River Corridors. These areas are generally to be managed to maintain their existing character. The alternatives do not change the overall management direction of these areas.

Effects on other resources
Several other resources are not affected by the programmatic management direction. These include but are not limited to caves, soils, and scenery.

Amendment found "non-significant" under NFMA

The purpose of this amendment is to incorporate management direction into plans for the conservation and recovery of the Canada lynx.

The NFMA significance determination is based on a review of the degree to which management direction for the area covered by a forest plan is being changed.

NFMA provides that forest plans may be amended in any manner, but if the amendment results in a significant change in the plan, additional procedures must be followed. Forest Service Handbook 1909.12, section 5.32, identifies four factors to consider in determining whether an amendment is significant. These factors are addressed below. Note, the BLM does not have a similar requirement under FLPMA; therefore this analysis only applies to land management plans prepared by the Forest Service.

The greatest change in existing plans would be caused by the selection of Alternatives B or C; therefore this analysis generally focuses on these alternatives. If an alternative with greater effects is selected, this analysis would be updated.

Factor 1: Timing
Identify when the change is to take place. Determine whether the change is necessary during or after the plan period or whether the change is to take place after the next scheduled revision of the forest plan.

NFMA requires that Forest and Grassland plans be revised every 15 years. All but one of the plans has been in place since 1986-1987. The plan revisions are scheduled in the next few years. The Targhee completed its plan revision in 2000. Thus for most plans it is late in the current planning period.

The amendment is taking place during the current planning period prior to completion of the revisions on all forests but the Targhee. As stated in FSH 1909.12, "the later the change, the less likely it is to be significant for the current forest plan." During revision, all units may revisit the management direction added by this amendment, and incorporate local information.

Factor 2: Location and size
Determine the location and size of the area involved. Define the relationship of the affected area to the overall planning area.

There are approximately 38.5 million acres within the 18 National Forests in the amendment area. Of this, approximately 18 million acres or 48 percent has been mapped as lynx habitat (see table 3.1). Most of the management direction proposed in the alternatives would modify the direction in land allocations that allow for development such as timber harvest. Of the 18 million acres of mapped lynx habitat, approximately 8 million acres are in land allocations that allow for management actions. This means only 20 percent of the 38.5 million acres

within the amendment area would be most affected by new management direction.

Factor 3: Goals, objectives and output Determine whether the change alters long-term relationships between the levels of goods and services projected by the forest plan. Consider whether an increase in one type of output would trigger an increase or decrease in another. Determine whether there is a demand for goods and services not discussed in the forest plan.

The amendment would add one goal to forest plans; conserve Canada lynx. This goal is consistent with other goals in existing plans and other legal requirements to provide for habitat needs for threatened and endangered species. The amendment would add several objectives to the plans. These objectives require consideration of natural ecosystem process and functions and consideration of lynx habitat needs. The additional objectives provide more species specific guidance but do not alter the overall objectives to provide for habitat needs for threatened and endangered species.

The amendment would not substantially alter outputs for grazing, minerals, transportation systems and developed recreation areas, such as ski areas. These activities would not be prohibited by the amendment; however, habitat needs for lynx would need to be considered when managing these resources. The amendment would preclude expansion of snow-compacting activities such as snowmobiling, but it would not change the status quo. What is currently groomed or designated would not change, at least under alternative B. Under Alternatives C, D and E additional expansion would be allowed under certain conditions.

The amendment would allow precommercial thinning on an estimated 185,000 acres under Alternatives B, C and E and 420,000 acres under Alternative D over the next 10 years, compared to 580,000 under Alternative A. Based on past experience approximately 34 percent of the needed precommercial thinning (no action) is actually funded; therefore the amendment would not substantially change the acres actually thinned.

Factor 4: Management prescriptions Determine whether the change in a management prescription is only for a specific situation or it would apply to future decisions throughout the planning area. Determine whether or not the change alters the desired future condition of the land and resources or the anticipated goods and services to be produced.

The amendment would apply to future decisions in lynx habitat and linkage areas throughout the planning area. The amendment does not change any Management Area (MA) designation. It does change the degree that some activities may occur within an MA. For example, it requires denning habitat be maintained at certain level. This standard could affect how much denning habitat could be removed, or where it should be retained, but it would not change MA designation. However, as noted in Chapter 3 for the

various resources the amendment is not likely to change the level of goods and services to be produced. It may increase the cost of managing for those goods and services.

Summary

Considering the four factors, adopting this amendment would not be a significant change under NFMA to the 18 plans being amended. This amendment is not a significant change under NFMA because it makes relatively minor changes in plan direction on a small proportion of the national forests. The new direction is a refinement of existing direction to maintain habitat for listed species, and does not alter management area designations or expected outputs. In addition, for all but one the direction will be of short duration.